Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

17. (currently amended) An optical signal transmitter comprising:

a laser diode for outputting an optical signal to be transmitted;

a driving current source for driving said laser diode;

a plurality of control circuits each providing a control signal for controlling the optical wavelength of said laser diode in different control modes, wherein each control [mode is] circuit generates the control signal based on a mutually different control parameter[s] corresponding to the control mode [representing external conditions detected by said control circuits that cause a wavelength variation]; and

a selector to select [at least] one of said control modes according to the status of electrical signals representing [the] external conditions of said laser diode, and to apply [a] the control signal[s] output from said selected control circuit to said laser diode driving current source, thereby achieving stabilizing control of optical wavelength with said selected control mode.

18. (currently amended) An optical signal transmitter comprising:

a a laser module including a laser diode for outputting an optical signal to be

transmitted and a cooling/heating element for adjusting the temperature of the laser diode;

a first driving [current source] circuit for driving said laser diode;

a second driving circuit for driving said cooling/heating element;

a parameter deviation detector to detect a first control deviation of [one] a parameter responsible for causing variations of optical wavelength output from said laser diode from a predetermined target value;

an optical wavelength deviation detector to detect a second control deviation of optical wavelength output from said laser diode from a predetermined target value;

a selector connected to said detectors so as to select either of said first and second control deviations; and

a controller connected [to] between the output of said selector and [to the input of said laser diode] one of said driving circuits to control [one of] said [parameters] laser module so that said selected control deviation is reduced.

19. (currently amended) An optical signal transmitter according to claim 18, wherein [one of] said parameter[s] deviation detector [is] detects [laser] the temperature of said laser module as said parameter.

20. (currently amended) An optical signal transmitter according to claim 18, wherein [one of] said parameter[s] deviation detector [is] detects driving current [for] of driving said laser diode as a parameter.

21. (previously amended) An optical signal transmitter according to claim 18, wherein said selector is constructed so as to select said second control deviation when said second control deviation is stably detected by said optical wavelength deviation detector, and to select said first control deviation when said second control deviation is not stably detected.

22. (previously amended) An optical signal transmitter comprising:

a laser module including a laser element, a temperature sensor and a cooling/heating element;

a first controller for stabilizing said optical wavelength;

a second controller for stabilizing said optical wavelength; and

a selector to select either of output signals from said first and second controllers according to the external conditions, so that stabilizing control of the optical wavelength of said laser element is performed according to the output signal from the selected controller, wherein:

said first controller comprises a temperature monitor coupled with said temperature sensor to monitor the temperature of said laser element detected by the temperature sensor, a first comparator coupled with said temperature monitor to detect the difference between the output value of the temperature monitor and a laser temperature control target value, and a first current controller coupled with said cooling/heating element to control the current flowing in the cooling/heating element according to an output signal from said first comparator, and

said second controller comprises an optical coupler arranged to split the output

light from the laser module, an optical wavelength monitor coupled with said optical coupler to monitor the wavelength of the split output light, a second comparator coupled with said optical wavelength monitor to detect the difference between the monitored optical output wavelength value and a wavelength control target value, and a second current controller coupled with said cooling/heating element to control the current flowing in the cooling/heating element according to an output signal from said second comparator.

23. (previously added) An optical signal transmitter according to claim 22, wherein said first and second current controller comprise a common current controller connected to said first and second comparators through said selector.

24. (previously added) An optical signal transmitter according to claim 22, further comprising:

a delay circuit coupled with said selector so as to delay the current control of said cooling/heating element based on said selected controller by a predetermined time after either of said first and second controllers to be selected is determined.

25. (currenlty amended) A control apparatus for stabilizing the wavelength of light output from a laser [element] module, comprising:

a plurality of control circuits for outputting control signals to control the optical wavelength of said laser [element] module in [respectively] different control modes[, wherein each control mode is] based on different control parameters to each other

[representing external conditions detected by said control circuits that cause a wavelength variation],

a control mode decision circuit for generating a mode signal depending on external conditions of said laser module: and

a [selecting means] selector for selecting [at least] one of control signals output from said control circuits according to the [status of electrical signals representing the external conditions of said laser element] mode signal supplied from said control mode decision circuit, and applying the selected control signal to said laser [element] module via a driving current source, thereby achieving stabilizing control of optical wavelength with one of said different control modes [selectively according to] depending on the external conditions of said laser [element] module.

26. (currently amended) A control apparatus for stabilizing optical wavelength according to claim 25, wherein, first one of said control circuits outputs a control signal depending on a control deviation of optical wavelength output from said diode module from a predetermined target value, said control mode decision circuit generates, when said [second] control deviation is stably detected by said [optical wavelength deviation detecting means,] first one of said control circuits, a mode signal for operating said [selecting means] selector to select[s said second control deviation] the output of said first one of said control circuits, and said control mode decision circuit generates, when said [second] control deviation is not stably detected, a mode signal for operating said [selecting means] selector to select[s said first control deviation] the output of one of the other of said control circuits.

27. (previously amended) A control method for stabilizing the wavelength of light output from a laser element, comprising the steps of:

selecting at least one of a plurality of control circuits, to output a control signal for controlling the optical wavelength of said laser element in respectively different control modes according to the status of external conditions of said laser element, wherein each control mode is based on different control parameters representing external conditions detected by said control circuit that cause a wavelength variation, and

applying a control signal output from said selected control circuit to said laser element, thereby achieving stabilizing control of optical wavelength with the control mode of said selected control circuit.

28. (previously added) A method for stabilizing optical wavelength according to claim 27, wherein in said selecting step, when said second control deviation is stably detected in said optical wavelength deviation detecting step, said second control deviation is selected, and when said second control deviation is not stably detected in said optical wavelength deviation detecting step, said first control deviation is selected.

REMARKS

Claims 17-28 are pending.

Claims 17-23 and 25-28 stand rejected.

Claim 24 is objected to.

Claims 17, 18, 19, 20, 25 and 26 have been amended.